

Patent Claims

1. A method for producing a circuit arrangement, in which

- an integrated circuit is formed in a substrate;
- an integrated reference electrode with a core that is made of a metal and is at least partly surrounded by a sheath made of a sparingly soluble salt of the metal is formed on the substrate;
- the integrated circuit is electrically coupled to the core;
- the core is formed by means of printing silver material as metal on the substrate.

2. A method for producing a circuit arrangement, in which

- an integrated circuit is formed in a substrate;
- an integrated reference electrode with a core that is made of a metal and is at least partly surrounded by a sheath made of a sparingly soluble salt of the metal is formed on the substrate;
- the integrated circuit is electrically coupled to the core;
- the core is formed from silver as metal by
 - o printing silver salt material on the substrate;
 - o chemically reducing the silver salt material to form silver.

3. A method for producing a circuit arrangement, in which

- an integrated circuit is formed in a substrate;
- an integrated reference electrode with a core that is made of a metal and is at least partly surrounded by a sheath made of a sparingly soluble salt of the metal is formed on the substrate;
- the integrated circuit is electrically coupled to the core;

- the core is formed from silver as metal by
 - o forming a silver layer on the substrate; and
 - o patterning the silver layer.
4. The method as claimed in one of claims 1 to 3, in which an electrically conductive coupling structure is formed in such a way that the integrated circuit is electrically coupled to the core by means of said coupling structure.
5. The method as claimed in claim 4, in which the coupling structure is arranged on and/or in the substrate in such a way that the core is formed by means of covering the coupling structure and/or the substrate with the silver material or the silver salt material.
6. The method as claimed in one of claims 1 to 5, in which silver chloride is used as the salt of the metal.
7. The method as claimed in one of claims 1 to 6, in which the core is at least partly surrounded by the sheath by chlorinating the core made of silver using
 - an electrochemical method or
 - a chemical method.
8. The method as claimed in one of claims 1 to 7, in which the circuit is set up in such a way that a signal characteristic of the electrical potential in a region surrounding the reference electrode can be provided to said circuit by the reference electrode.
9. The method as claimed in one of claims 1 to 8, in which the substrate used is
 - a semiconductor material;
 - glass;
 - plastic; and/or

- ceramic.

10. The method as claimed in one of claims 4 to 9, in which the coupling structure is formed from

- gold; and/or
- platinum.

11. The method as claimed in one of claims 1 to 10, in which the circuit arrangement is formed as a sensor arrangement.

12. The method as claimed in one of claims 1 to 11, in which the circuit arrangement is formed as a biosensor arrangement.



12-30-2004

- 28 -

DE0303123

New Patent Claims

1. A method for producing a biosensor circuit arrangement,
 - 5 • in which an integrated circuit is formed in a substrate;
 - in which a core of an integrated reference electrode is formed by means of printing silver material as metal on the substrate;
 - 10 • in which biological molecules are applied by means of printing on sensor arrays of the biosensor circuit arrangement, whereby the sensor arrays are biologically activated;
 - in which the printing of silver material on the substrate and the printing of the biological molecules on the sensor arrays are effected in the same work step;
 - 15 • in which the core made of silver material is subsequently at least partly surrounded by a sheath made of a sparingly soluble salt of the silver material, thereby forming the integrated reference electrode;
 - 20 • in which the integrated circuit is electrically coupled to the core of the integrated reference electrode.
 - 25
2. A method for producing a biosensor circuit arrangement,
 - 30 • in which an integrated circuit is formed in a substrate;
 - in which a core of an integrated reference electrode made of silver as metal is formed by
 - o printing silver salt material on the substrate;
 - o chemically reducing the silver salt material to
 - 35 form silver;
 - in which biological molecules are applied by means of printing on sensor arrays of the biosensor circuit arrangement, whereby the sensor arrays are biologically activated;
 - 40 • in which the printing of the core of the integrated reference electrode on the substrate and the printing of the biological molecules on the sensor arrays are effected and in the same work step;
 - 45 • in which the core of the integrated reference electrode is subsequently at least partly surrounded by a sheath made of a sparingly soluble

- salt of the silver as metal, thereby forming the integrated reference electrode; and
- in which the integrated circuit is electrically coupled to the core of the integrated reference electrode.
3. The method as claimed in claim 1 or 2, in which an electrically conductive coupling structure is formed in such a way that the integrated circuit is electrically coupled to the core by means of said coupling structure.
4. The method as claimed in claim 3, in which the coupling structure is arranged on and/or in the substrate in such a way that the core is formed by means of covering the coupling structure and/or the substrate with the silver material or the silver salt material.
5. The method as claimed in one of claims 1 to 4, in which silver chloride is used as the salt of the metal.
6. The method as claimed in one of claims 1 to 5, in which the core is at least partly surrounded by the sheath by chlorinating the core made of silver using
- an electrochemical method or
 - a chemical method.
7. The method as claimed in one of claims 1 to 6, in which the circuit is set up in such a way that a signal characteristic of the electrical potential in a region surrounding the reference electrode can be provided to said circuit by the reference electrode.
8. The method as claimed in one of claims 1 to 7, in which the substrate used is
- a semiconductor material;
 - glass;
 - plastic; and/or
 - ceramic.
9. The method as claimed in one of claims 3 to 8, in which the coupling structure is formed from
- gold; and/or
 - platinum.